4) Passive movements.
5) Knee twisting.
6) Knee brace - only during exercise.

II Torn or Displaced Semi-lunar Cartilage.
Internal cart.
1) Twisting knee in flexion - semi-lunar notch exposed.

Symptoms 1) Sudden acute pain.
Instability to get knee straight.

Treatment. Displaced & not torn.
1) Put back to position
2) Knee immobilized in ℔. of P. in stretch position. 3-4 weeks.
- cart. re-attaches itself.
4) Patient walks.
5) No passive motion for 5-6 weeks.
6) No knee twisting for " .

Chronic - reshappened again & again.

Treatment
1) Operation - ~~torn semi-lunar cart.~~
2) Knee brace always.
3) Remove torn semi-lunar cart.
4) Active motion - 10 days after stitches are out.
5) Prognosis good.
6) If not removed - develops traumatic arthritis -
- irritation of knee surfaces.

Syllabus -

1. Normal + structure of skin
2. Factors responsible for upright position
3. Kyphosis - everything.
4. Round Shoulders.
5. Lordosis
6. Normal pelvic tilt
   - common alterations of tilt.
   - disabilities produced.
7. Scoliosis. - postural, structural
   - method of exam of spine.
8. Flat back.
9. Torti - colli.
10. Normal structural function of foot.
11. Flat foot.
12. Deformities of toes
    Clawtoes - -
13. Talipes Valgus - enough to recognize.
14. Chorea
15. Infantile paralysis. - precautions in during
16. Rickettes - deformities produced.
17. Anemia + chlorosis.
18. Constipation.
19. Menstruation.
20. Tonsils + adenoids - exercises.
    mouth - breathing.
21. Respiratory diseases -
    - precautions in exercise.
22. Somatic conditions
    - Ankle, knee.
23. Classification of units + effects.
    Analyse units of exercise.
24. Respiration + on circulation.

451

28. Remedial gymnastic scheme.
- order & aims.

MOVEMENTS.

ACTIVE (BY PATIENT)

PASSIVE (BY GYMNAST)

FREE (NO OUTSIDE FORCE)

ASSISTED.

RESISTED.

1) PATIENT MOVES - GYMNAST OPPOSES.
2) OUTSIDE FORCE MOVES - PATIENT RESISTS.

CONCENTRIC - ACTIVE
ECCENTRIC - ACTIVE
STATIC.

RANGE OF MOVEMENT. (JOINT MOVEMENT.)
Amt. of mvt occurring in jt.
when muscles involved move from longest to shortest contraction & vice versa.

SPECIAL EXERCISES

Bust
(1) Standing, heels on ground, reaching above head with arms and hands.
(2) Standing, fingers pushing together, elbows up in front of chest.
(3) Standing, arms flinging between x and fly, feet apart.

Round Shoulders
(1) Standing, hands clasped behind neck, pressing back with elbows.
(2) Standing, single arm circling backward.
(3) Standing, feet apart, arms flinging between x and fly.
(4) Kneeling on hands and knees, alternate arms flinging sideways.
(5) Standing, shoulders rolling backward.
(6) Sitting, feet close to hips, chest lifting with arms raising sideways, then relaxing.
(7) Standing, back to stall-bars, arms at shoulder height, hips to stall-bars, chest pushing forward.
(8) Standing, arms flinging backward, fold and fly.

Partners standing, passive exercise -
(1) Arms circling backward with help.
(2) Sitting, hands clasped around partner's neck, chest lifting and pushing forward.

Waist
(1) "S" standing, feet apart, side bending.
(2) Standing, feet apart, both arms swinging down one side and up across to opposite side.
(3) On Hands and knees, trunk twisting with single arm flinging right and left.
(4) Standing, feet apart, trunk twisting with single arm flinging right and left.
(5) Lying on back, hands behind head, leg swinging from side to side with support of helper.
(6) Standing, feet apart, alternate arm pushing right and left.

Abdomen
(1) Lying on back, arms above head, trunk bending forward quickly.
(2) Lying on back, legs raising to upright, and slowly back again.
(3) Lying on back, arms to side, trunk bending slowly forward, arms raising to side and back again.
(4) Lying on back, trunk and arms raise to meet raised feet.
(5) On knees, trunk bending backward with support of helper.
(6) Lying on the stomach, feet apart, hip raising.
(7) Lying on back, feet under stall-bar, trunk bending forward to grasp stall-bar.
(8) Standing, feet apart, stretching arms high above head, then bending to touch floor with hands.
(9) On hands and knees, same arm and leg bending and stretching, change to opposite arm and leg.
(10) Hanging from stall-bars, single and double knee lifting and stretching and slowly lowering.

Hips
(1) Jumping between knees full bend and standing with feet apart.
(2) Standing, alternate leg swinging forward and backward.
(3) Standing, alternate leg swinging from side to side in front of other leg.
(4) Kneeling on hands and knees, bending and stretching same leg and arm, then oposite arm and leg.
(5) Sitting position, feet out in front, alternate hips moving forward.

Hips

(6) Lying on back, arms to side, alternate leg crossing to right angles and back.
(7) Lying on back, bicycling.
(8) Sitting position, feet out in front, straight legs going apart and together.
(9) Lying on back, hands behind head, straight legs swinging from side to side, partner holding elbows.
(10) Sitting position, feet out in front, rolling from side to side.

Lower back

(1) Knees full bend, hands on floor, knee stretching.
(2) Standing, feet apart, hands behind head, trunk pulling down, then straightening back.
(3) Sitting position, feet out in front, trunk bending forward to grasp ankles and arm bending.
(4) Sitting position, feet out in front, trunk springing forward with partner's help.
(5) Sitting position, feet out in front, arms swinging between x and fly, and trunk springing four times.
(6) Lying on back, alternate knee lifting and stretching with help of hands.
(7) Lying on back, alternate knee and head meeting and lowering.

Thigh

(1) Sitting position, feet out in front, straight legs going apart and together.
(2) Standing, alternate leg swinging across other leg and back.
(3) Standing, alternate leg circling forward and backward.
(4) Knees full bend to knee stretch.

Feet

(1) Walking and standing on outer edge of foot.
(2) Bouncing up and down on the toes.
(3) Curling and uncurling toes as in picking up marbles.
(4) Standing, curling and uncurling toes to draw alternate feet across floor.
(5) Sitting position, feet out in front, ankle turning and stretching.
(6) Half crouch sitting, drawing one foot up front of opposite calf.

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The Role of Abdominal Exercise in a Program of Physical Fitness

By

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and

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IN A physical fitness program there is the aim to develop or educate the physical for the sake of increasing physical ability. Along with this aim is an effort to obtain through the physical education, an education of the esthetic, the ethical, the intellectual, and the technical.[1] The desire for bodily poise and gracefulness of movement, the fair play of competitive sports, the quick thinking and reasoning associated with solving problems in work or play, and the accomplishments of fundamental techniques essential to good performance—are all examples of education through the physical.

In dealing with education of the physical one is confronted with various aims—development of strength, endurance, skill, flexibility, muscular coordination, agility. Accomplishments in endurance, skill, agility, and in muscular coordination are to a great extent the result of repeated practice in specific activities, while strength and flexibility are fundamental accomplishments of individual muscles or muscle groups. For the accomplishments of endurance, skill, agility, and muscular coordination, an individual practices a specific activity or one comparable to that activity. In a wartime preparedness program, much practice is devoted to activities most nearly like those which will confront the individual in battle.

The development of strength and flexibility, on the other hand, need not be specific for certain types of activity, but should be general so far as body musculature is concerned. The needs of the body in regard to strength and flexibility, as well as the accomplishment of well balanced muscular strength are best obtained by a carefully planned exercise program, as differentiated from an activity program.

[1] Taken from the definition of education in Webster's *Unabridged Dictionary*.

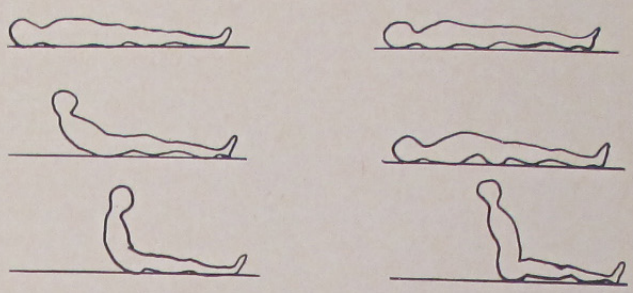


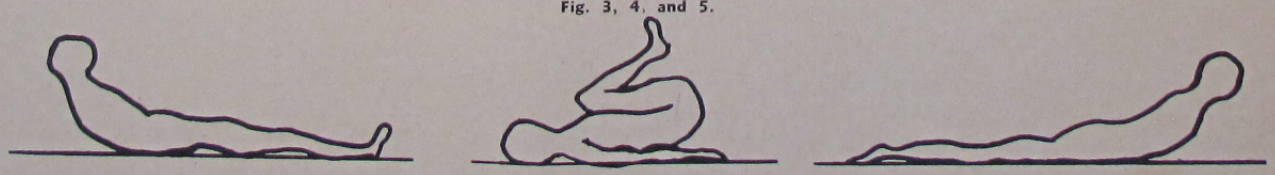
Fig. 1 and 2.

In most physical education programs, exercises for arm and shoulder muscles, as well as leg muscles meet requirements for building up strength and flexibility. But this is not true in the average program of exercises for trunk muscles. Particularly does this criticism apply to exercises intended to strengthen abdominal muscles. The use of double-leg raising from a supine or hanging position, and trunk raising to a sitting position are too-well established as abdominal exercises. Unfortunately, both these exercises can be done —and all too frequently are done—in a way that not only fails to increase, but often weakens, abdominal muscles.

ANTERIOR abdominal muscles produce two movements: (1) flexion of the thorax on the pelvis, and (2) flexion of the pelvis on the thorax (i.e., backward tilt of the pelvis and flattening of the lumbar spine). Hip flexor muscles act to (1) flex the thigh on the pelvis or (2) flex the pelvis on the thigh (denoted in standing by an anterior tilt of the pelvis and lordotic position of the low back). Obviously the action of the hip flexors is in opposition to that of the abdominals so far as the movement of tilting the pelvis is concerned.

No abdominal muscles cross the hip joint and therefore cannot act in the movement of flexing the thigh on the pelvis. The position or movement of the pelvis *during* double-leg raising determines whether or not the abdominal muscles are exercised to advantage

Fig. 3, 4, and 5.



cation program? To the writer, it seems that we can, within the limitations of our subject matter, physical activity, make at least four important emphases in our program for girls and women.

The Physical-Developmental Emphasis

This term rather than "physical fitness" is preferable since it applies more specifically to the somewhat limited phase of total physical fitness to which physical education should contribute. To help each girl or woman to attain a high physical and organic development in terms of increased strength, endurance, and improved muscular and organic functioning, is and always will be the primary function of a physical education program. Few girls have ever really attained that state of physical development which makes them capable of performing in an adequate, capable way in any and all situations they may meet. This implies strength, endurance, and mechanical efficiency for the ordinary physical tasks of life such as walking, running, lifting, pulling, carrying, climbing, throwing, jumping, as well as for extreme exertion of all powers in emergency tasks which many of them will be called to perform, not only in this war period, but in other emergency situations which constantly recur throughout life. This emphasis also implies the development of the neuromuscular system to the extent that physical tasks can be accomplished with ease and skill.

Obviously, optimum achievement in physical development must be considered as a relative and individual matter. Its measurement can only be in terms of increased and improved individual functioning. In general terms it can be said that an individual has attained her optimal physical and organic development when she (1) is free from physical handicaps; (2) has attained an anatomical and physiological development commensurate with age, sex, and general body type; (3) has sufficient strength, endurance, skill, and organic vigor to produce and function daily at a high level without undue strain or fatigue; (4) can meet emergency periods of physical wear and tear without breakdown and with quick recovery.

Specifically, we must now plan a program for the high school girl or college woman, which will develop (a) muscular strength, especially of shoulders, arms, abdomen, and feet, enabling her to carry herself with ease through the many ordinary daily, physical tasks as well as emergency tasks; (b) general body flexibility; (c) motor fitness or efficient, skilled ability to perform; (d) functional posture or grace, poise, and balance of body segments in all body movements; (e) sound circulatory-respiratory functional relationship or organic endurance; (f) orderly and non-hampering menstrual function; (g) normal body proportion and maintenance of proper weight.

These implications for program building are enormous. Very properly, therefore, now as well as in the future, this physical-developmental objective should form the cornerstone of our program.

Recreational Emphasis

This, perhaps more than ever, is still an important objective for a girl's physical education program. Certainly, any educated girl or woman needs to have at her command enough skill in some physical activity to enable her to enjoy doing it both in school and after her school days are over. No physical education program should fail in its attempt to provide opportunity to learn skills in sports which can be used for recreation, or to attempt to develop a taste or real love for some form of physical recreation. Recreation is not a dilatory, superficial, rather pleasant way of wasting time, but an activity engaged in because of real enjoyment engendered by real skill in and knowledge of the activity. A physical education program should be so organized that opportunity for the learning of physical recreational skills and values is given to every girl.

Group-Social Emphasis

By this is meant the varied types of behavior patterns one learns when having to perform as a member of a well coordinated group. There is much which any girl can gain from playing hard as a member of a team. From the standpoint of individual, social development, team play or work represents a high peak. Many girls never have had the opportunity of developing this social pattern before leaving school. Therefore, since working with others in a cooperative, congenial way contributes immeasurably to successful living, this is a valuable contribution which physical education can and should make.

Emphasis Upon Knowledge and Fact

To fail to provide the student with the necessary facts and information about herself and the values of the various areas of the physical education program she engages in, is to fail to bring about any real understanding or appreciation of the contribution physical education can make toward the improvement of her physical welfare. In physical education these learnings may be grouped somewhat as follows:

1. Knowledge and information related to each individual's own physical capacities. How are these capacities to be measured and improved? How can these capacities best be used and conserved for increased functioning? What factors contribute to loss and depletion of energies and abilities? How does each individual stand in estimated capacity relative to a norm or standard?

2. Knowledge about skills, about games and sports, how they are played, strategy, rules, history, officiating. Information of this nature is essential to a full appreciation of any activity, and contributes to the building of real recreational interests.

3. Knowledge relative to the organization of groups for the effective practice and enjoyment of both individual and group activities. Too little time is spent, usually, in bringing such techniques to the attention of our students, yet many of them, if equipped with such

(Continued on Page 509)

along with the hip flexor action. If double-leg raising is associated with initial hyper-extension of the lumbar spine, then abdominal muscles are not exercised to advantage.

To exercise the abdominal muscles along with the double-leg raising, emphasis must be placed on contracting the abdominal muscles to flatten the back against floor or table, and hold that position of backward pelvic tilt as the weight of the legs is raised. The weight of the legs acts as a downward pull on the ilium against the upward pull by the abdominal muscles, and when strength of abdominal muscles is not sufficient to sustain that weight, the pelvis tilts and the back arches from the floor as the legs are raised. When the back arches, the abdominal muscles are in a state of tension. Palpation denotes a firmness of the muscles which is often confused with the firmness of active contraction. The weight of the legs raised slowly in flexion is so great at the initiation of movement, that in cases of weak abdominal muscles this load applied with the muscle in a state of tension is sufficient to strain the muscles. In cases of marked abdominal weakness, this amount of weight may cause herniation. If the back cannot be held flat during leg raising, other exercises should, by all means, be substituted if one expects to improve abdominal tone.

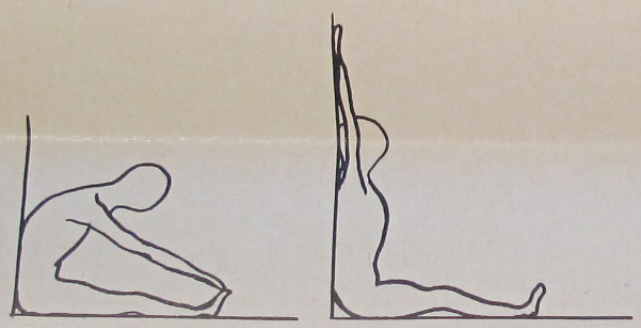


Fig. 6.

Even in individuals whose abdominal muscle strength is sufficient to hold the back flat against the leg weight, there is a question as to whether the leg raising is advisable. Most exercise programs contain sufficient emphasis on hip flexor action among the leg exercises. If then hip flexor exercises are added to leg raising and to trunk raising (as discussed below), there may result an overdevelopment of the hip flexor group. Because the hip flexor muscles tilt the pelvis forward and act as a direct *opponent* of the abdominal muscles in the action of tilting the pelvis, an overemphasis in exercising the hip flexor will create tendencies toward development of a lordosis.

Trunk raising from a supine to a sitting position may be done in two ways:

(1) "Folding" up to a sitting position, that is, initiating the movement by lifting the head, then shoulders and thorax, then flexing the pelvis on the thigh.

(2) Hyper-extending the low back and raising the extended trunk up to the erect sitting position by the flexion of the pelvis on the thigh. (In exercises, this

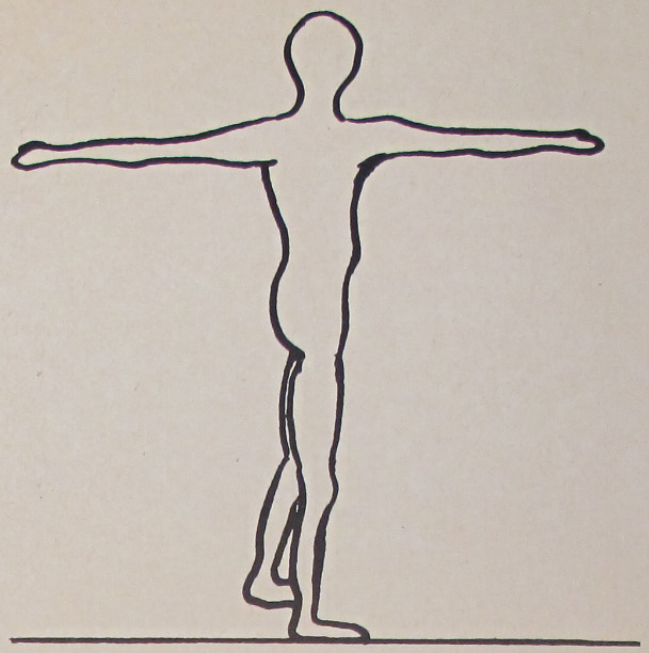


Fig. 7.

movement is frequently described as coming up to sitting with "chest leading."

Number (1) above is a combination of strong anterior abdominal and strong hip flexor action. The anterior abdominal muscles flex the thorax on the pelvis to the point of completion of *trunk* flexion, then they continue to hold, as the hip flexors (pulling origin toward insertion) flex the pelvis on the thigh. In this movement strong abdominal action will be obtained, but the completion of the exercise involves strong hip flexor action. Number (2) above, is a tremendously strong hip flexor exercise and may strain rather than strengthen the abdominal muscles. The initial forward tilt of the pelvis and hyperextension of the spine place the abdominal muscles in position of tension. As the extended trunk is flexed on the thigh the abdominal muscles are forced to assume the weight of the upper trunk while in this state of tension.

Overload of a muscle at any time will result in strain. And the amount of load that can be assumed while the muscle is in tension is much less than the amount it can assume in a position of semi-contraction. Weight of the trunk in trunk raising or weight of the legs in double leg raising associated with a

(Continued on Page 504)

Fig. 8.